REMARKS

The Office Action dated April 20, 2007 has been received and carefully noted. The above amendments to the Specification and the claims, and the following remarks, are submitted as a full and complete response thereto.

By this Response, claims 4-5 have been amended to more particularly point out and distinctly claim the subject matter of the present invention, and new claims 13-15 were added. No new matter has been added. Support for the above amendments is provided in the Specification on at least page 10, paragraph [0053] to page 13, paragraph [0063]. Accordingly, claims 1-15 are currently pending in the application, of which claims 1, 8, 11, and 12 are independent claims.

In view of the above amendments and the following remarks, Applicant respectfully requests reconsideration and timely withdrawal of the pending objections to the Specification and the pending objections and rejections to the claims for the reasons discussed below.

Specification

The Office Action objected to the Abstract of the disclosure because of the use of legal phraseology.

Accordingly, Applicants have amended the Abstract of the disclosure to comply with the requirements of MPEP §608.01(b).

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Therefore, Applicants respectfully request withdrawal of the objections to the Abstract of the disclosure, and respectfully submit that the Abstract is now in compliance with the requirements of MPEP §608.01(b).

Claim Objections

The Office Action objected to claims 4-6 because of minor informalities. Specifically, the Office Action indicated that the recitation of "the channel symbols transmitted using different transmit paths and different times appears to be a new limitation lacking antecedent basis since it further specifies the channel symbols previously mentioned in claim 1. (See Office Action on page 2, paragraph 4)

Accordingly, Applicants have amended claims 4 and 5 to provide sufficient antecedent basis for the aforementioned claim limitations. Claim 6 depends from claim 5.

Therefore, Applicants respectfully request withdrawal of the objections to claims 4-6, and respectfully submit that claims 4-6 are now in condition for allowance.

Claim Rejections under 35 U.S.C. §103(a)

Claims 1, 7-8, 11, and 12

The Office Action rejected claims 1, 7-8, 11, and 12 under 35 U.S.C. §103(a) as allegedly unpatentable as obvious over Walton, *et al.* (U.S. Patent Publication No. 2002/0154705) ("Walton") in view of Tirkkonen, *et al.* (PCT Application No. WO

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03/001728) ("Tirkkonen"). The Office Action alleged that Walton discloses or suggests every claim feature with the exception of "using, when constructing the channel symbols, at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing a linear combination, wherein the ratio of the first coefficient and the second coefficient is not a real number" as recited in claim 1. The Office Action cited Tirkkonen to cure the deficiencies of Walton. Applicants respectfully traverse these rejections for at least the following reasons.

Claim 1, upon which claim 7 is dependent, recites a transmission method. The transmission method includes constructing layered channel symbols as linear combinations of complex modulation symbols, transmitting the channel symbols via at least two transmit paths, and using, when constructing the channel symbols, at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing a linear combination. The transmission method also includes using, for at least one modulation symbol, a first non-zero total power for transmission on a first transmit path of the at least two transmit paths, and a second non-zero total power for transmission on a second transmit path of the at least two transmit paths. The ratio of the first coefficient and the second coefficient is not a real number. The first and second total powers are not equal.

Claim 8 recites a transmitter. The transmitter includes an antenna system for achieving two transmit paths for transmission of a signal, a first modulator for modulating the signal to be transmitted into complex modulation symbols, and a second

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modulator for constructing layered channel symbols as linear combinations of the complex modulation symbols. The second modulator is configured to construct the channel symbols by using at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing the linear combination. The ratio of the first and second coefficient is not a real number. The second modulator and the antenna system are configured to transmit the channel symbols by using, for at least one modulation symbol, a first non-zero total power for transmission on a first transmit path, and a second non-zero total power for transmission on a second transmit path. The first and second total powers are not equal.

Claim 11 recites a base station transmitter of a cellular radio system. The base station transmitter includes an antenna system for achieving two transmit paths for transmission of a signal, a first modulator for modulating the signal to be transmitted into complex modulation symbols, and a second modulator for constructing layered channel symbols as linear combinations of the complex modulation symbols. The second modulator is configured to construct the channel symbols by using at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing the linear combination. The ratio of the first and second coefficient is not a real number. The second modulator and the antenna system are configured to transmit the channel symbols by using, for at least one modulation symbol, a first non-zero total power for transmission on a first transmit path, and a second non-zero total power for transmission on a second transmit path. The first and second total powers are not equal.

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Claim 12 recites terminal equipment of a cellular radio system. The terminal equipment includes an antenna system for achieving two transmit paths for transmission of a signal, a first modulator for modulating the signal to be transmitted into complex modulation symbols, and a second modulator for constructing layered channel symbols as linear combinations of the complex modulation symbols. The second modulator is configured to construct channel symbols by using at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing the linear combination. The ratio of the first and second coefficient is not a real number. The second modulator and the antenna system are configured to transmit the channel symbols by using, for at least one modulation symbol, a first non-zero total power for transmission on a first transmit path, and a second non-zero total power for transmission on a second transmit path. The first and second total powers are not equal.

As will be discussed below, Walton in view of Tirkkonen fails to disclose or suggest every claim feature recited in claims 1, 7-8, 11, and 12, and therefore fails to provide the features of the claims discussed above.

Walton is directed to a transmitter and receiver units for use in a communications system and configurable to provide antenna, frequency, or temporal diversity, or a combination thereof, for transmitted signals. (Walton, Abstract; page 1, [paragraph [0012] to page 2, paragraph [0022])

Applicants respectfully submit that Tirkkonen is not a proper reference to reject claims 1, 7-8, 11, and 12 under 35 U.S.C. §103(a). Specifically, Tirkkonen is not a

proper reference to reject the aforementioned claims under 35 U.S.C. §103(a) because Tirkkonen fails to satisfy the requirements of 35 U.S.C. §102. Tirkkonen has a publication date of January 3, 2003, and a filing date of June 24, 2002. In contrast, the present application has a priority date of November 17, 2003, for which the claim of foreign priority under 35 U.S.C. §119(a)-(d) was filed on February 4, 2004. Further, both the present application and Tirkkonen have the same inventors, Ari Hottinen and Olav Tirkkonen. In view of these factors, Tirkkonen fails to satisfy the requirements of any section of 35 U.S.C. §102. Specifically, since the inventors are the same, the reference is not "by another" as required by 35 U.S.C. §102(e) or "by others" as required by 35 U.S.C. §102(a). Accordingly, Applicants respectfully submit that Tirkkonen is not a proper reference to reject claims 1, 7-8, 11, and 12 under 35 U.S.C. §103(a).

Therefore, as previously noted, Walton fails to disclose or suggest every claim feature recited in claim 1, and similarly in claims 8, 11, and 12. Specifically, Walton fails to disclose or suggest at least "using, when constructing the channel symbols, at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing a linear combination, wherein the ratio of the first coefficient and the second coefficient is not a real number." Tirkkonen is not a proper reference to reject the aforementioned claims under 35 U.S.C. §103(a). Accordingly, the Office Action fails to establish a *prima facie* case of obviousness with respect to claims 1, 8, 11, and 12.

Claim 7 depends from claim 1. Accordingly, claim 7 should be allowable for at least its dependency upon an allowable base claim.

Therefore, Applicants respectfully request withdrawal the rejections of claims 1, 7-8, 11, and 12. Accordingly, Applicants respectfully submit that claims 1, 8, 11, and 12, and the claims that depend therefrom, are in condition for allowance.

Claims 2 and 9

The Office Action rejected claims 2 and 9 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Walton in view of Tirkkonen, and further in view of Sampath (U.S. Patent Publication No. 2003/0043929) ("Sampath").

As will be discussed below, Walton in view of Tirkkonen, and further in view of Sampath fails to disclose or suggest every claim feature recited in claims 2 and 9, and therefore fails to provide the features of the claims discussed above.

Walton and Tirkkonen were discussed above. Sampath discloses a method and system for preprocessing transmit signals in spatial multiplexing and diversity systems that include multiple transmit antennae. (Sampath, Abstract; page 2, paragraph [0023] to page 3, paragraph [0031])

As noted above with respect to claim 1, Walton fails to disclose or suggest every claim feature recited in claim 1. Tirkkonen is not a proper reference to reject claim 1 under 35 U.S.C. §103(a). Sampath fails to cure the deficiencies of Walton. Specifically, Sampath fails to disclose or suggest at least "using, when constructing the channel symbols, at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing a linear combination, wherein the ratio of the first coefficient

and the second coefficient is not a real number" as recited in claim 1. Accordingly, Walton in view of Tirkkonen, and further in view of Sampath fails to disclose or suggest every claim feature recited in claim 1.

Claims 2 and 9 depend from claim 1. Accordingly, claims 2 and 9 should be allowable for at least their dependency upon an allowable base claim, and for the limitations recited therein.

Therefore, Applicants respectfully request withdrawal the rejections of claims 2 and 9. Accordingly, Applicants respectfully submit that claims 2 and 9 are in condition for allowance.

Claims 3 and 10

The Office Action rejected claims 3 and 10 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Walton in view of Tirkkonen, and further in view of Lott, *et al.* (U.S. Patent Publication No. 2004/0120287) ("Lott").

As will be discussed below, Walton in view of Tirkkonen, and further in view of Lott fails to disclose or suggest every claim feature recited in claims 3 and 10, and therefore fails to provide the features of the claims discussed above.

Walton and Tirkkonen were discussed above. Lott discloses a system and method for decreasing delays and thereby improving the performance of data transmissions in wireless communication systems by enabling increased data transmission rates to be

selected for a reverse link between an access terminal and an access network. (Lott, Abstract; page 2, paragraphs [0012]-[0018])

As noted above with respect to claim 1, Walton fails to disclose or suggest every claim feature recited in claim 1. Tirkkonen is not a proper reference to reject claim 1 under 35 U.S.C. §103(a). Lott fails to cure the deficiencies of Walton and Tirkkonen. Specifically, Lott fails to disclose or suggest "using, when constructing the channel symbols, at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing a linear combination, wherein the ratio of the first coefficient and the second coefficient is not a real number" as recited in claim 1. Accordingly, Walton in view of Tirkkonen, and further in view of Lott fails to disclose or suggest every claim feature recited in claim 1.

Claims 3 and 10 depend from claim 1. Accordingly, claims 3 and 10 should be allowable for at least their dependency upon an allowable base claim, and for the limitations recited therein.

Therefore, Applicants respectfully request withdrawal the rejections of claims 3 and 10. Accordingly, Applicants respectfully submit that claims 3 and 10 are in condition for allowance.

Claims 4-6

The Office Action rejected claims 4-6 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Walton in view of Tirkkonen, and further in view of Brailean, *et al.* (U.S. Patent No. 6,002,715) ("Brailean").

As will be discussed below, Walton in view of Tirkkonen, and further in view of Brailean fails to disclose or suggest every claim feature recited in claims 4-6, and therefore fails to provide the features of the claims discussed above.

Walton and Tirkkonen were discussed above. Brailean discloses a receiver unit for determining a quality value for a received signal whereby the quality value for the received signal is determined based on symbols with similar absolute voltage levels. (Brailean, Abstract; col. 2, lines 25-29)

As noted above with respect to claim 1, Walton fails to disclose or suggest every claim feature recited in claim 1. Tirkkonen is not a proper reference to reject claim 1 under 35 U.S.C. §103(a). Brailean fails to cure the deficiencies of Walton and Tirkkonen. Specifically, Brailean fails to disclose or suggest "using, when constructing the channel symbols, at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing a linear combination, wherein the ratio of the first coefficient and the second coefficient is not a real number" as recited in claim 1. Accordingly, Walton in view of Tirkkonen, and further in view of Brailean fails to disclose or suggest every claim feature recited in claim 1.

Claims 4-6 depend from claim 1. Accordingly, claims 4-6 should be allowable for at least their dependency upon an allowable base claim, and for the limitations recited therein.

Therefore, Applicants respectfully request withdrawal the rejections of claims 4-6. Accordingly, Applicants respectfully submit that claims 4-6 are in condition for allowance.

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CONCLUSION

In conclusion, Applicants respectfully submit that Walton, Tirkkonen, Lott, and Brailean fail to disclose or suggest every claim feature recited in claims 1-15. Further, Applicants respectfully submit that Tirkkonen fails to qualify as a proper reference to reject claims under 35 U.S.C. §103(a) because Tirkkonen fails to satisfy the requirements of 35 U.S.C. §102. The distinctions previously noted are more than sufficient to render the claimed invention unobvious. Further, Applicants respectfully submit that the Abstract of the disclosure is in compliance with MPEP §608.01(b), and therefore in condition for issuance. It is therefore respectfully requested that all of claims 1-15 be allowed, and this present application passed to issuance.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

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In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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Enclosures: Petition for Extension of Time
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